

Application No. 10/057,983  
 Amendment dated January 28, 2004  
 Reply to Office Action of October 28, 2003

### Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

### Listing of Claims:

1. (currently amended) A system for allocating a supply of a component, the system comprising:

a) a computerized database containing electronically readable information related to said component, said information describing the supply and changes to the supply, said information defining variables comprising:

$\omega_{CS}$ ,  $\omega_R$ ,  $\omega_M$ , and  $\omega_I$  representing weightings for customer service, revenue, margin, and inventory for said component,

$\gamma_{CS}$ ,  $\gamma_R$ ,  $\gamma_M$ , and  $\gamma_I$  representing scaling factors for customer service, revenue, margin, and inventory for said component,

$x_{it}$  is a binary variable,

$\delta_{it}$  representing a scaling factor to give preference for shipping orders on-time versus shipping late or early,

$\alpha_i$  representing a revenue associated with a demand  $i$ ,

$\beta_i$  representing a margin associated with said demand  $i$ ,

$c_j$  representing a standard cost of an item  $j$ ,

$u_{jk}$  representing a quantity of consumed inventory,

$t_{jk}$  representing a quantity of issued inventory,

$I_{jt}$  representing an inventory of an item  $j$  at end of a time period  $t$ ,

$M$  representing a number of independent demands, and

$T$  representing a number of time periods; and

b) a computerized supply planner that automatically produces a supply plan using synchronized allocation through an objective function:

$$\max \left[ \omega_{cs} \gamma_{cs} \sum_{i=1}^M \sum_{t=1}^T \delta_{it} x_{it} + \omega_R \gamma_R \sum_{i=1}^M \left( \alpha_i \sum_{t=1}^T x_{it} \right) + \omega_M \gamma_M \sum_{i=1}^M \left( \beta_i \sum_{t=1}^T x_{it} \right) \right]$$

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$$- \omega_i \gamma_i \left( \sum_{j=1}^M \left( c_j \sum_{t=1}^T I_{jt} \right) + \sum_{j=1}^M \left( c_j \sum_{k=1}^T \left( t_{jk} - \sum_{t=1}^T u_{jkt} \right) \right) \right) \right]$$

2. (cancelled)

3. (currently amended) The system of claim 1 further comprising a computerized resource optimizer, wherein said resource optimizer uses automated matched sets logic.

4. (currently amended) The system of claim 1 further comprising a computerized product attribute defining tool.

5. (currently amended) The system of claim 4, wherein said computerized product attribute defining tool [[allows]] that accepts engineering specification information from a user and [[to]] automatically defines the component by using the [[an]] electronically readable engineering specification information.

6 (currently amended) The system of claim 1 further including a computerized constraint-based master planner, whereby said constraint-based master planner allows a user to automatically specify one or more electronically readable goals to be considered by the computerized supply planner.

7. (currently amended) The system of claim 6, wherein said goals comprise:  
a [[the]] maximization of revenue,  
a maximization of margin,  
a maximization of inventory, or  
a maximization of customer service.

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8. (currently amended) The system of claim 1 further comprising a computerized product change analyzer, wherein said product change analyzer automatically compares the effects of a change to ~~[[in]]~~ the supply at different times.
9. (currently amended) The system of claim 1 further comprising a computerized comparer, wherein said comparer automatically assesses differences in an electronically readable first supply plan for the supply of the component and an electronically readable second supply plan for a modified supply of the component.
10. (currently amended) The system of claim 1 further comprising a computerized resource requirements planner, wherein said resource requirements planner automatically suggests a change in the supply to address a shortage identified by the supply planner.
11. (currently amended) The system of claim 1 further comprising a computerized finite resource planner wherein said finite resource planner automatically suggests an optimal use of the supply to address a shortage identified by the computerized supply planner.
12. (currently amended) The system of claim 1 further comprising a computerized customer promiser, wherein said computerized customer promiser automatically determines a remainder of the supply following implementation of the supply plan, and automatically assesses ~~[[accesses]]~~ feasibility of a new order using on the remainder.
13. (currently amended) The system of claim 1 further comprising a ~~[[n]]~~ computerized interactive master scheduler.
14. (currently amended) The system of claim 1, wherein said database comprises electronically readable input data, electronically readable user-specified data, and electronically readable output data.

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15. (currently amended) A method for allocating a supply of a component, the method comprising the steps of:

a) forming a database on a computer, said database containing electronically readable information related to said component, said information describing the supply and changes to the supply, said information defining variables comprising:

$\omega_{CS}$ ,  $\omega_R$ ,  $\omega_M$ , and  $\omega_I$  representing weightings for customer service, revenue, margin, and inventory for said component,

$\gamma_{CS}$ ,  $\gamma_R$ ,  $\gamma_M$ , and  $\gamma_I$  representing scaling factors for customer service, revenue, margin, and inventory for said component,

$x_{it}$  is a binary variable,

$\delta_{it}$  representing a scaling factor to give preference for shipping orders on-time versus shipping late or early,

$\alpha_i$  representing a revenue associated with a demand  $i$ ,

$\beta_i$  representing a margin associated with said demand  $i$ ,

$c_j$  representing a standard cost of an item  $j$ ,

$u_{jkt}$  representing a quantity of consumed inventory,

$t_{jk}$  representing a quantity of issued inventory,

$I_{jt}$  representing an inventory of an item  $j$  at end of a time period  $t$ ,

$M$  representing a number of independent demands, and

$T$  representing a number of time periods; and

b) said computer automatically producing an electronically readable supply plan using synchronized allocation through an objective function:

$$\max \left[ \omega_{CS} \gamma_{CS} \sum_{i=1}^M \sum_{t=1}^T \delta_{it} x_{it} + \omega_R \gamma_R \sum_{i=1}^M \left( \alpha_i \sum_{t=1}^T x_{it} \right) + \omega_M \gamma_M \sum_{i=1}^M \left( \beta_i \sum_{t=1}^T x_{it} \right) - \omega_I \gamma_I \left( \sum_{j=1}^M \left( c_j \sum_{t=1}^T I_{jt} \right) + \sum_{j=1}^M \left( c_j \sum_{k=1}^T \left( t_{jk} - \sum_{t=1}^T u_{jkt} \right) \right) \right) \right]$$

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16. (currently amended) The method of claim 15, wherein said computer [[information]] automatically defines the component using an electronically readable engineering specification.

17. (cancelled)

18. (currently amended) The method of claim 15 further comprising the step of computerized optimizing of the supply using automated matched sets logic.

19. (currently amended) The method of claim 15 further comprising the step of computerized specifying of one or more goals to be considered in the step of producing a supply plan.

20. (currently amended) The method of claim 15 further comprising the steps of:

- a) computerized modifying of said database to reflect a change in the supply at a first time;
- b) computerized preparing of a first supply plan for said first modified database;
- c) computerized modifying of said database to reflect the change in the supply at a second time;
- d) computerized preparing of a second supply plan for said second modified database; and
- e) computerized comparing of the effects of said first and said second supply plans.

21. (currently amended) The method of claim 15 further comprising the steps of

- a) computerized modifying of said database to reflect a change in the supply;
  - b) computerized preparing of a modified supply plan for said modified database;
- and
- c) computerized comparing of the effects said supply plan and said modified supply plan.

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22. (currently amended) The method of claim 15 further comprising the steps of:
- a) computerized identifying of a shortage in the supply created in said supply plan;
- and
- b) computerized modifying of use of said supply to address said shortage.
23. (currently amended) The method of claim 15 further comprising the steps of:
- a) computerized identifying a shortage in the supply created in said supply plan; and
  - b) computerized modifying said supply plan address said shortage.
24. (currently amended) The method of claim 15 further comprising the steps of
- a) computerized determining of a remainder of the supply following implementation of the supply plan, and
  - b) computerized accessing of [[the]] feasibility of a new order using the remainder.
25. (currently amended) A program storage device readable by a machine, tangibly embodying a program of instructions executable by a machine to perform method steps of:
- a) said machine forming an electronically readable database containing information related to a supply of a component, said information describing the supply and changes to the supply, said information defining variables comprising:
    - $\omega_{CS}$ ,  $\omega_R$ ,  $\omega_M$ , and  $\omega_I$  representing weightings for customer service, revenue, margin, and inventory for said component,
    - $\gamma_{CS}$ ,  $\gamma_R$ ,  $\gamma_M$ , and  $\gamma_I$  representing scaling factors for customer service, revenue, margin, and inventory for said component,
    - $x_{it}$  is a binary variable,
    - $\delta_{it}$  representing a scaling factor to give preference for shipping orders on-time versus shipping late or early,
    - $a_i$  representing a revenue associated with a demand  $i$ ,
    - $\beta_i$  representing a margin associated with said demand  $i$ ,
    - $c_j$  representing a standard cost of an item  $j$ ,
    - $u_{jkt}$  representing a quantity of consumed inventory,

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$t_{jk}$  representing a quantity of issued inventory,  
 $I_{jt}$  representing an inventory of an item  $j$  at end of a time period  $t$ ,  
 $M$  representing a number of independent demands, and  
 $T$  representing a number of time periods;

b) said machine using synchronized allocation and matched sets logic to automatically produce a supply plan for said supply through an objective function:

$$\max \left[ \omega_{cs} \gamma_{cs} \sum_{i=1}^M \sum_{t=1}^T \delta_{it} x_{it} + \omega_R \gamma_R \sum_{i=1}^M \left( \alpha_i \sum_{t=1}^T x_{it} \right) + \omega_M \gamma_M \sum_{i=1}^M \left( \beta_i \sum_{t=1}^T x_{it} \right) - \omega_I \gamma_I \left( \sum_{j=1}^M \left( c_j \sum_{t=1}^T I_{jt} \right) + \sum_{j=1}^M \left( c_j \sum_{k=1}^T \left( t_{jk} - \sum_{t=1}^T u_{jkt} \right) \right) \right) \right];$$

; and

c) said machine automatically allocating said supply using said supply plan.

26. (currently amended) The program storage device readable of claim 25, wherein the method steps performed by said program on instructions further comprise [[ing]] said machine automatically defining [[a product attribute defining tool that allows a user to define]] the component by using an engineering specification.

27. (currently amended) The program storage device readable of claim 25, wherein the performed method steps performed by said program instructions further comprise:

- a) said machine automatically identifying a shortage in the supply created in said supply plan; and
- b) said machine automatically modifying said supply plan to address said shortage.